Abstract

Master's thesis „Segmental evaluation of standing posture using accelerometers" is focused on assessment of relationships between body segments during quiet standing with varied sensory afferentation according to CTSIB test.

Theoretical part reviews prevailing theoretical work regarding posture, stability, equilibrium and balance and discusses the possibilities of posture assessment with accent on accelerometry and jerk based metrics.

The objective of experimental part is to discover influence of sensory afferentation on following aspects: acceleration and jerk of body segments (head, thorax, sacrum and shins); linear correlation of acceleration between body segments; linear correlation of jerk between body segments; jerk magnitude ratio of individual segments.

The results demonstrate increasing jerk of sacrum and shins with more demanding postural condition. Jerk linear correlations vary from 0,05 to 0,3 which contradicts the simple inverted pendulum hypothesis of body movement during quiet standing. Higher correlations are registered in the standing on the foam surface compared to firm surface. This relation is accentuated while standing with closed eyes. Higher correlations suggest increasing tendency to the single segment strategy. All above mentioned data are statistically significant. Jerk of shin in proportion to the jerk of other segments increases with more demanding postural condition. This relationship is statistically significant in standing on foam surface with eyes closed compared to other conditions.